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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Washino et al

Serial No.: 08/298,104

Group No.: 2602

Filed: August 30, 1994

Examiner: Burgess

For: MULTI-FORMAT AUDIO/VIDEO PRODUCTION SYSTEM

AMENDMENT

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Dear Sir:

In response to the Office Action dated April 10, 1995,
please amend the above-referenced application as follows:

IN THE CLAIMS

1. (Amended) A multi-format audio/video production
system adapted for use with a display device, comprising:

means to receive an input signal representative of an
audio/video program in one of a plurality of display formats;

a graphics processor connected to receive the [input
signal] audio/video program and convert the display format of
the program into an intermediate production format, the
graphics processor including:

a standard/widescreen interface unit operative to
convert the video program in the [input] production format into
an output signal representative of a standard/widescreen
formatted program [image], and

a high-definition television (HDTV) interface unit
operative to convert the video program in the [input]
production format into an output signal representative of an

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HDTV-formatted program [image];

high-capacity video storage means;

an operator interface; and

a [centralized] controller in operative communication with the means to receive the input signal [a video program], the graphics processor, the high-capacity video storage means and the operator interface, whereby commands entered by an operator through the interface cause the following functions to be performed: [graphics processor to perform one or more of the conversions using the standard/widescreen and high-definition television interfaces.]

(a) the conversion of an audio/video program into the production format.

(b) storage of a program in the production format in the high-capacity video storage means.

(c) the conversion of a program in the production format into a standard/widescreen program, either directly from the means to receive the input signal or from the high-capacity video storage means, and

(d) the conversion of a program in the production format into an HDTV program, either directly from the means to receive an input signal or from the high-capacity video storage means.

2. (Amended) The multi-format audio/video production system of claim 1, the graphics processor further including a film output video interface, the controller further being operative, in response to a command entered by an operator,

[operative] to convert the video program in the input format into an output signal for photographic production, either directly from the means to receive the input signal or from the high-capacity video storage means.

3. (Amended) The multi-format audio/video production system of claim 1, including [wherein the] input and output signals [may be] compatible with any of the following standard formats: RGB, YIQ, YUV, and Y/R-Y/B-Y.

4. (Amended) The multi-format audio/video production system of claim 1, including [wherein the] input and output signals [may be] compatible with a video standard utilizing separate luminance and chrominance component video signals.

5. (Amended) The multi-format audio/video production system of claim 1, wherein the means to receive an input signal representative of a video program includes a digital video camera including:

a plurality of one or more [charge-coupled-device] image sensors;

an analog-to-digital converter circuit connected to the output of each image sensor to generate a digital signal representative of the sensed image; and

a digital signal processor configured to receive the digital signal from each analog-to-digital converter circuit and generate a digital video output signal in a predetermined input format for processing by [an] one or more of the interface units comprising [of] the graphics processor.

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8. (Amended) The multi-format audio/video production system of claim 1 wherein [the graphics processor is operative to crop the video program in the first format into format having a different aspect ratio], in the event that a change in aspect ratio results from any of the format conversions, the controller further is operative to cause the [extent of the cropping being] change in aspect ratio to be visibly evident on the display device.

9. (Amended) The multi-format audio/video production system of claim 1 wherein [the video program in the first format includes 24 frame-per-second images,] the graphics processor [further being] is operative to convert a [the] 24 frame-per-second [images] format input signal into a 30 frame-per-second NTSC-compatible format output signal.

10. (Amended) The multi-format audio/video production system of claim 1 wherein [the video program in the first format includes 24 frame-per-second images,] the graphics processor [further being] is operative to convert [the] a 24 frame-per-second [images] format input signal into a 25 frame-per-second PAL/SECAM-compatible format output signal.

11. (Amended) The multi-format audio/video production system of claim 1 wherein the [video program in the first format includes 24 frame-per-second images, the] graphics processor [further being] is operative to convert [the] a 24 frame-per-second [images] format input signal into an HDTV-compatible format output signal.

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12. (Amended) The multi/format audio/video production system of claim 1, including means to receive an RGB video signal having a chrominance bandwidth and a luminance bandwidth, and wherein the HDTV interface further provides means for reducing the chrominance bandwidth of [an] the RGB video signal without reducing its luminance bandwidth, [comprising] the HDTV interface including:

three low-pass filters, one associated with each of the R, G, and B components of the RGB video signal[s] to remove all frequency components above a specified frequency;

an RGB-to-Y matrix circuit connected to receive each of the R, G, and B components [signals]; the RGB-to-Y matrix circuit being operative to combine the signals in predetermined proportions and produce a single luminance signal, Y;

a high-pass filter connected to the output of the RGB-to-Y matrix circuit to filter the Y signal to remove all frequency components below a specified frequency;

a Y-to-RGB matrix circuit connected to the output of the high-pass filter, the Y-to-RGB matrix circuit being operative to separate the high-pass-filtered Y signal into R', G' and B' [signals] components in the same proportion as previously combined by the RGB-to-Y matrix circuit;

[three mixer circuits, each having as inputs one of the three R-R', G-G' and B-B' pairs,] three mixers, each adapted to receive an R/R', G/G' and B/B' pair, respectively, each mixer being operative to mix the signals of its respective input pairs and generate R'', G'' and B'' signals having full luminance bandwidth and reduced chrominance bandwidth.

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13. (Amended) A multi-format audio/video production system forming part of a general-purpose computer platform having a user input and color display, the system comprising:

means to receive an input video program in one of a plurality of input formats;

means to convert the input program into a 24 frames-per-second (fps) production format, if not already in such a format [necessary, according to one of the following aspect ratios] for review on the color display[:

1024 x 576 pixels, 1024 x 768 pixels, 1280 x 720 pixels, and 1280 x 960 pixels]; and

means to convert the production [version] format into one or more of the following output formats, each with a predetermined image dimension in pixels:

NTSC at 30 fps, PAL/SECAM at 25 fps, HDTV at 25 fps, HDTV at 30 fps, and film-compatible video at 24 fps.

Claim 14, line 3, replace "version" with --format--.

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16. (Amended) The multi-format audio/video production system of claim 13 wherein the means to convert the production [version] format into one or more of the output formats includes means to increase the frame rate from the 24 fps production format frame rate to a 25 fps output frame rate.

17. (Amended) In an enhanced personal computer having a color monitor, the method of producing a video program, comprising the steps of:

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receiving an input video program;
converting the input video program into a production
format having a predetermined frame rate [of 24 frames per
second and one of the following] and image dimension[s] in
pixels[:]

[1024 x 576,

1024 x 768,

1280 x 720,

1280 x 960;]

displaying the video program on the color monitor
using the predetermined frame rate and image [in one of the
pixel] dimensions in pixels, including cropped versions of the
program, [wherein] with the extent of the cropping [is] being
visually evident on the monitor;

manipulating the video program to create a desired
edited version of the program in [a] an [final] output format,
including an output format having [which may have] a frame rate
and image [pixel] dimensions in pixels different from that of
the production format; and

outputting the desired edited version of the program
in the [final] output format.

Cancel claim 21.

Please add new claims 22-25 as follows:

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-- 22. The multi-format audio/video production system
of claim 1, the graphics processor further including means for
transferring a program into the intermediate production format
to a remote location equipped with one or more of the interface

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units.

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~~23~~ 24. The multi-format audio/video production system of claim ~~23~~, including output formats having the following image dimensions in pixels:

1024 x 576,

1024 x 768,

1080 x 720, and

1080 x 960.

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~~24~~ 25. The multi-format audio/video production system of claim ~~24~~ wherein the means to convert the production format into one or more of the output formats includes means to increase the frame rate from the 24 frames per second production frame to an output having a frame rate of substantially 30 frames per second.

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~~25~~ 26. The method of claim ~~25~~ wherein the step of manipulating the video program to create a desired edited version of the program in an output format includes creating a program having one of the following image dimensions in pixels:

1024 x 576,

1024 x 768,

1080 x 720, and

1080 x 960.

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~~26~~ 27. The method of claim ~~26~~ wherein the step of converting the input video program into a production format includes converting the input video program into a production

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format characterized in having 24 frames per second.--

Remarks

Applicant thanks Examiner Burgess for the personal interview with Applicant's attorney John G. Posa on May 25, 1995.

Claims 1-20 and new claims 22-26 are pending in the application and are presented for reconsideration in light of the following remarks.

Respecting the rejections under 35 USC §112:

a) Claim 1 has been amended to recite more definitely the interconnection and functionality of the graphics processor;

b) In claims 2 and 3, Applicant now recites with greater specificity that the selection of the various input and outputs are under operator control;

c) In claims 8-11, with the added limitation of a working format, the phrase "the first format" should now have a clear antecedent basis;

d) Claim 12 has been amended to make it clear that "RGB" refers to the chrominance information, whereas Y refers to luminance information, and, given this distinction, claim 12 should now be complete;

e) In claim 13:

1) the phrase "if necessary ..." should now be clear with the addition of the phrase "if not already in a 24 FPS format."

2) the phrase "the production version" now finds clear antecedent basis as "the production format;"

3) claim 12, the "R/R', G/G' and B/B' pairs" have been provided with antecedent basis; and

4) the function of the mixers has been made more clear and unambiguous.

f) In claim 17, "which may have" has been deleted in favor of "including frame rates and pixel dimensions different from that of the production format."

g) The definition of "final format" has been given a more specific meaning.

Claims 1-4, 8-11 and 13-20 stand rejected under 35 USC §102(e) as being anticipated by Hailey, U.S. Patent No. 5,243,433. Claim 1 has been amended to include high-capacity video storage means and an aspect always present in independent claims 13 and 17, that is, an internal production or "working" format which may be stored and/or used as the basis for input to the interface units so as to create a standard/widescreen or HDTV output formatted imagery. Hailey neither implies nor suggests the use of such an intermediate format, nor does Hailey include any means for the storage of images, temporarily or permanently during conversion directly from an input format to an output format. In fact, the Hailey apparatus is substantially limited to a scan-conversion pipeline wherein input images are sequentially converted into an output format directly, obviating the need for a high-capacity storage means, as now recited in claim 1.

Thus, in contrast to this invention, which can later select a previously stored program in the production format and convert it into either a standard/widescreen formatted program, an HDTV-formatted program or both simultaneously, Hailey is restricted to a direct conversion of a scanned film format to an output limited to a specified aspect ratio in pixels. Indeed, in Hailey, the input and the output format are identical, since, once he has selected

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which portion of the input format he intends to view through his "window" (see Figure 2), there is no distinction between that which is scanned and that which is finally output. In contrast, the present invention, due to the high-capacity storage means as now set forth in claim 1, in cooperation with the operator interface and interface units, the instant system may carry out numerous conversions from one format to another, including simultaneous conversions to different formats. It should also be noted that the present invention has always claimed methods and apparatus which operate upon audio/video programs, whereas Hailey is entirely dedicated to images without sound.

Claims 5-7 stand rejected under 35 USC §103 as being unpatentable over Hailey in view of Sharman et al., U.S. Patent No. 5,045,913. Applicant believes that, with the extensive amendments made to claim 1, that the Hailey reference has been overcome, and that the claims currently rejected on obviousness grounds are likewise allowable. Nevertheless, it is noted that Sharman, like Hailey, is restricted to a pipeline-like configuration wherein scanned images flow directly from an input source to produce an output signal; in the case of Sharman, the images flow is from a motion picture film scanner to produce a high-definition television signal. Sharman et al. does not include a high-capacity video storage means, as now recited in claim 1, nor does Sharman et al. include the wide range of format conversion capabilities in claim 1 and present in all other independent claims. It is noted that the frame stores (64a and 64b of Sharman et al.) are used only for this purpose, that is, to temporarily store video frames for final conversion to R, G and B components, so as to convert a sequential scan into an interlaced scan (see col. 6, lines 32-48 of Sharman et

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al.). Thus, Sharman neither anticipates nor makes obvious the use of a high-capacity storage medium, nor does this reference imply or suggest the use of an intermediate or production format to enable the various conversions and other operations made possible by this invention.

Applicant accordingly believes all remaining claims are now in condition for allowance, and timely notice thereof is hereby solicited. Questions regarding this application may be directed to the undersigned attorney at the telephone and fax numbers provided.

Respectfully submitted,

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